

Appl. No. 10/785,088
In re Kroppe
Reply to Office Action of June 30, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A ~~An integrated~~ fluid control system for a motor vehicle having at least one drive axle having left and right axle shafts each provided with a wheel mounted thereon, said ~~hydraulic~~ fluid control system comprising:

a vehicle torque control system including at least one fluidly operated clutch provided to regulate a drive torque distribution between said wheels of said motor vehicle in order to improve traction and stability of said motor vehicle on a drive surface;

a vehicle body roll control system including at least one fluidly operated force device operatively connecting sprung and unsprung masses of the motor vehicle and provided to tilt a vehicle body relative to a vehicle chassis so as to counteract a rollover-inducing force; and

a common source of a fluid pressure provided to operate both said vehicle body roll control system and said vehicle torque control system;

said torque control system further including a left axle disconnect clutch provided to selectively disconnect a torque transfer from a prime mover of the motor vehicle to the left wheel thereof, a right axle disconnect clutch provided to selectively disconnect a torque transfer from

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the prime mover of the motor vehicle to the right wheel thereof, and left and right clutch actuators each provided for selectively operating corresponding one of said left and right clutches between a disengaged condition and an engaged condition in response to the fluid pressure from said common source of the fluid pressure.

Claim 2 (currently amended): The ~~integrated~~ fluid control system as defined in claim 1, wherein said torque control system includes at least one variable control valve in fluid communication with said common source of the fluid pressure for selectively regulating a fluid pressure supplied to said at least one clutch from said common source of the fluid pressure for continuously varying a torque transfer ratio through said at least one clutch between the engaged and disengaged conditions, and wherein said vehicle body roll control system includes at least one variable control valve in fluid communication with said common source of the fluid pressure for selectively regulating a fluid pressure supplied to said at least one force device from said common source of the fluid pressure.

Claim 3 (currently amended): The ~~integrated~~ fluid control system as defined in claim 2, wherein said at least one variable control valve of said torque control system and said at least one variable control valve of said vehicle body roll control system are selectively and variably controlled by an electronic controller in response to at least one vehicle parameter.

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Claim 4 (currently amended): The ~~integrated~~ fluid control system as defined in claim 3, wherein said torque control system includes:

a differential assembly coupled to each of said left and right axle shafts outwardly extending from said differential assembly;

a fluidly operated selectively engageable lock-up clutch for limiting relative rotation between said left and right axle shafts; and

a lock-up clutch actuator for selectively operating said lock-up clutch between a disengaged condition and an engaged condition in response to the fluid pressure from said common source of the fluid pressure.

Claim 5 (currently amended): The ~~integrated~~ fluid control system as defined in claim 4, wherein said torque control system further includes a variable lock-up control valve in fluid communication with said common source of the fluid pressure for selectively regulating a fluid pressure supplied to said lock-up clutch actuator from said common source of the fluid pressure for continuously varying a torque transfer ratio through said lock-up clutch between the engaged and disengaged conditions.

Claim 6 (currently amended): The ~~integrated~~ fluid control system as defined in claim 5, wherein said lock-up clutch is a friction clutch.

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Claim 7 (canceled)

Claim 8 (currently amended): The ~~integrated~~ fluid control system as defined in claim [[7]]
1, wherein said torque control system further includes variable left and right control valves each
in fluid communication with said common source of the fluid pressure for selectively regulating
a fluid pressure supplied to each of said left and right clutch actuators from said common source
of the fluid pressure.

Claim 9 (currently amended): The ~~integrated~~ fluid control system as defined in claim 8,
wherein said left and right clutches are friction clutches.

Claim 10 (currently amended): The ~~integrated~~ fluid control system as defined in claim 3,
wherein said vehicle body roll control system further includes a variable roll control valve in
fluid communication with said common source of the fluid pressure for selectively regulating a
fluid pressure supplied to said at least one fluidly operated force device from said common
source of the fluid pressure.

Claim 11 (currently amended): The ~~integrated~~ fluid control system as defined in claim 10,
wherein said at least one fluidly operated force device of said vehicle body roll control system is
a fluid pressure actuator.

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Claim 12 (currently amended): The ~~integrated~~ fluid control system as defined in claim 11, wherein said fluid pressure actuator includes a pressure cylinder in fluid communication with said variable roll control valve, a piston reciprocating within said pressure cylinder, and a piston rod connected to said piston and extending through said pressure cylinder; a distal end of said pressure cylinder is secured to one of the sprung mass and the unsprung mass of the motor vehicle and a distal end of said piston rod is secured to the other one of the sprung mass and the unsprung mass of the motor vehicle.

Claim 13 (currently amended): The ~~integrated~~ fluid control system as defined in claim 1, wherein said torque control system and said vehicle body roll control system are selectively and variably controlled by an electronic controller in response to at least one vehicle parameter or at least one operating parameter of said ~~integrated~~ fluid control system.

Claim 14 (currently amended): The ~~integrated~~ fluid control system as defined in claim 1, wherein said common source of the fluid pressure for said vehicle torque control system and said vehicle body roll control system is selectively and variably controlled by an electronic controller in response to at least one vehicle parameter or at least one operating parameter of said ~~integrated~~ fluid control system.

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Claim 15 (currently amended): The ~~integrated~~ fluid control system as defined in claim 1, wherein said common source of the fluid pressure includes a fluid pump.

Claim 16 (currently amended): The ~~integrated~~ fluid control system as defined in claim 15, wherein said common source of the fluid pressure further includes a fluid pressure accumulator in fluid communication with said fluid pump.

Claim 17 (currently amended): The ~~integrated~~ fluid control system as defined in claim 16, wherein said common source of the fluid pressure further includes a fluid reservoir storing a supply of an appropriate fluid.

Claim 18 (currently amended): The ~~integrated~~ fluid control system as defined in claim 3, wherein said electronic controller is connected to a plurality of sensors each indicative to at least one vehicle parameter or at least one operating parameter of said ~~integrated~~ fluid control system as a control input.

Claim 19 (currently amended): The ~~integrated~~ fluid control system as defined in claim 18, wherein said at least one vehicle parameter is one of a speed difference between input and output of one of said clutches, a vehicle speed, a vehicle lateral acceleration, a yaw rate and a steering angle.

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Claim 20 (currently amended): The ~~integrated~~ fluid control system as defined in claim 18, wherein said at least one operating parameter of said ~~integrated~~ fluid control system is one of a fluid pressure supplied to said torque and body roll control systems by said common source of the fluid pressure, a fluid pressure supplied to said at least one clutch of said vehicle torque control system and a fluid pressure supplied to said at least one fluidly operated force device of said vehicle body roll control system.

Claim 21 (new): A fluid control system for a motor vehicle having at least one drive axle having left and right axle shafts each provided with a wheel mounted thereon, said fluid control system comprising:

a vehicle torque control system including at least one fluidly operated clutch provided to regulate a drive torque distribution between said wheels of said motor vehicle in order to improve traction and stability of said motor vehicle on a drive surface;

a vehicle body roll control system including at least one fluidly operated force device operatively connecting sprung and unsprung masses of the motor vehicle and provided to tilt a vehicle body relative to a vehicle chassis so as to counteract a rollover-inducing force; and

a common source of a fluid pressure provided to operate both said vehicle body roll control system and said vehicle torque control system;

said common source of the fluid pressure for said vehicle torque control system and said vehicle body roll control system being selectively and variably controlled by an electronic

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controller in response to at least one vehicle parameter or at least one operating parameter of said fluid control system.

Claim 22 (new): A fluid control system for a motor vehicle having at least one drive axle having left and right axle shafts each provided with a wheel mounted thereon, said fluid control system comprising:

a vehicle torque control system including at least one fluidly operated clutch provided to regulate a drive torque distribution between said wheels of said motor vehicle in order to improve traction and stability of said motor vehicle on a drive surface;

a vehicle body roll control system including at least one fluidly operated force device operatively connecting sprung and unsprung masses of the motor vehicle and provided to tilt a vehicle body relative to a vehicle chassis so as to counteract a rollover-inducing force; and

a common source of a fluid pressure provided to operate both said vehicle body roll control system and said vehicle torque control system;

said torque control system further including at least one variable control valve in fluid communication with said common source of the fluid pressure for selectively regulating a fluid pressure supplied to said at least one clutch from said common source of the fluid pressure for continuously varying a torque transfer ratio through said at least one clutch between the engaged and disengaged conditions;

said vehicle body roll control system further including at least one variable control valve

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in fluid communication with said common source of the fluid pressure for selectively regulating a fluid pressure supplied to said at least one force device from said common source of the fluid pressure;

said at least one variable control valve of said torque control system and said at least one variable control valve of said vehicle body roll control system being selectively and variably controlled by an electronic controller in response to at least one vehicle parameter;

said electronic controller connected to a plurality of sensors each indicative to at least one vehicle parameter or at least one operating parameter of said fluid control system as a control input;

said at least one operating parameter of said fluid control system being one of a fluid pressure supplied to said torque and body roll control systems by said common source of the fluid pressure, a fluid pressure supplied to said at least one clutch of said vehicle torque control system and a fluid pressure supplied to said at least one fluidly operated force device of said vehicle body roll control system.